



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,802	11/25/2003	Qi Cheng	SVL920030080US1	6257

47069 7590 02/26/2007  
KONRAD RAYNES & VICTOR, LLP  
ATTN: IBM54  
315 SOUTH BEVERLY DRIVE, SUITE 210  
BEVERLY HILLS, CA 90212

EXAMINER
----------

ALI, MOHAMMAD

ART UNIT	PAPER NUMBER
----------	--------------

2166

MAIL DATE	DELIVERY MODE
-----------	---------------

02/26/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

<b>Interview Summary</b>	Application No. 10/721,802	Applicant(s) CHENG ET AL.	
	Examiner Mohammad Ali	Art Unit 2166	

All participants (applicant, applicant's representative, PTO personnel):

- (1) Mohammad Ali. (3) \_\_\_\_.
- (2) Janaki K. Davda (RN: 40,684). (4) \_\_\_\_.

Date of Interview: 21 February 2007.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: 1.

Identification of prior art discussed: None.


Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant's representative agreed Examiner's proposal (adding claim limitations of 10 to all independent claims) which was given before the final office action. After receiving the amendment further will be conducted another office action will follow-up.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

  
Examiner's signature, if required

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

### Title 37 Code of Federal Regulations (CFR) § 1.133-Interviews

#### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

## KONRAD RAYNES & VICTOR, LLP

315 S. Beverly Drive, Suite 210  
Beverly Hills, California 90212

Telephone: (310) 556-7983  
Facsimile: (310) 556-7984

### FAX COVER SHEET

### PLEASE DELIVER THIS FACSIMILE TO EXAMINER MOHAMMAD ALI

TO: Commissioner for Patents  
Attn: Examiner Mohammad Ali  
Group Art Unit 2166  
Patent Examining Corps  
Facsimile Center  
Alexandria, VA 22313

FROM: Janaki K. Davda

OUR REF: 0055.0069  
TELEPHONE: 310-556-7983

Total pages, including cover letter: 13

PTO FAX NUMBER 1-571-273-4105

If you do NOT receive all of the pages, please telephone us at 310/556-7983, or fax us at 310/556-7984.

Description of Documents Transmitted: PROPOSED AGENDA FOR INTERVIEW

Applicant: O. CHENG et al.  
Serial No.: 10/721,802  
Filed: November 25, 2003  
Group Art Unit: 2166  
Docket No.: SVL920030080US1

I hereby certify that this paper is being transmitted by facsimile to the U.S. Patent and Trademark Office on February 14, 2007

By: Janaki K. Davda  
Name: Janaki K. Davda

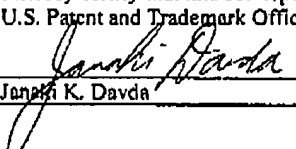
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Q. CHENG et al.	Examiner	Mohammad Ali
Serial No.	10/721,802	Group Art Unit	2166
Filed	November 25, 2003	Docket No.	SVL920030080US1
TITLE	METHOD, SYSTEM, AND PROGRAM FOR QUERY OPTIMIZATION WITH ALGEBRAIC RULES		

---

## CERTIFICATE UNDER 37 CFR 1.8:

I hereby certify that this correspondence is being transmitted by facsimile to Mohammad Ali of the U.S. Patent and Trademark Office at 1-571-273-4105 on February 14, 2007.

  
Janaki K. Davda

**INFORMAL/DRAFT COMMUNICATION -**  
**DO NOT ENTER INTO PROSECUTION RECORD:**  
**PROPOSED AGENDA FOR INTERVIEW**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Examiner:

This agenda is being submitted prior to a telephone interview.

The tentative participants are Examiner Ali and Janaki K. Davda.

The proposed date of Interview is Wednesday, February 21, 2007. The proposed time is 1:00 p.m. (EST).

A telephone interview is requested.

No exhibit will be shown.

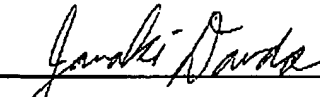
Dated February 14, 2007

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

Applicants would like to discuss the claims as amended in the amendment filed on February 14, 2007, a copy of which is attached.

Dated: February 14, 2007

By:

  
Janaki K. Davda  
Registration No. 40,684

Please direct all correspondences to:

Janaki K. Davda  
Konrad Raynes & Victor, LLP  
315 South Beverly Drive, Ste. 210  
Beverly Hills, CA 90212  
Tel: (310) 553-7973  
Fax: 310-556-7984

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s):	Q. CHENG et al.	Examiner	Mohammad Ali
Serial No.	10/721,802	Group Art Unit	2166
Filed	November 25, 2003	Docket No.	SVL920030080US1
TITLE	METHOD, SYSTEM, AND PROGRAM FOR QUERY OPTIMIZATION WITH ALGEBRAIC RULES		

---

**CERTIFICATE UNDER 37 CFR 1.8:**

I hereby certify that this correspondence is being transmitted through the USPTO EFS-Web system over the Internet to Mohammad Ali of the U.S. Patent and Trademark Office on February 14, 2007.

/Janaki K. Davda/  
Janaki K. Davda Reg. No. 40,684

**REPLY UNDER 37 CFR 1.116 - EXPEDITED PROCEDURE**  
**REQUEST FOR RECONSIDERATION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Remarks/Arguments begin on page 7.

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Previously Presented) A method for executing a query, comprising:  
matching a query to an outlier materialized query table that stores exception data;  
searching the query for a source predicate;  
searching an outlier predicate in the outlier materialized query table that corresponds to the source predicate for a target column that corresponds to a source column in the source predicate;  
deriving a new range predicate based on the target column; and  
introducing the new range predicate into the query, wherein the query is executed to retrieve data from one or more data stores.
2. (Original) The method of claim 1, further comprising:  
merging the new range predicate into the query.
3. (Previously Presented) The method of claim 1, further comprising:  
generating a bounds view from source predicate information and range binding information collected for the target column, wherein the bounds view computes a lower bound and an upper bound for the new range predicate, and wherein the bounds view ~~may be~~ is capable of being generated using at least one of a range multiplying technique or a range stretching technique.
4. (Original) The method of claim 1, wherein matching the query to an outlier materialized query table further comprises:  
creating a first query graph model representation of the query;  
creating a second query graph model representation of the outlier materialized query table; and  
comparing the first query graph model and the second query graph model.



Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

5. (Original) The method of claim 1, wherein there is a join in the outlier materialized query table and wherein matching further comprises:  
determining that join predicates other than the outlier predicate in the outlier materialized query table have matching predicates in the query.
6. (Original) The method of claim 5, wherein the new range predicate is derived by selecting the target column from base tables involved in the join.
7. (Original) The method of claim 6, wherein the target column is from a table other than the one in which the source column resides.
8. (Original) The method of claim 6, wherein the target column is from a same table as the one in which the source column resides.
9. (Original) The method of claim 1, wherein the query contains a correlation predicate.
10. (Original) The method of claim 9, further comprising:  
translating the correlation predicate into a join predicate in a context of the outlier materialized query table;  
when the translated join predicate matches the join predicate in the outlier materialized query table, deriving a new predicate for the correlation predicate in a child query block using a source predicate on a quantifier of a parent query block; and  
wherein searching the query for the source predicate further includes searching the parent query block for the source predicate.
11. (Previously Presented) An article of manufacture comprising one of hardware logic and a computer readable medium including a program for executing a query, wherein the hardware logic or program causes operations to be performed, the operations comprising:  
matching a query to an outlier materialized query table that stores exception data;  
searching the query for a source predicate;

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

searching an outlier predicate in the outlier materialized query table that corresponds to the source predicate for a target column that corresponds to a source column in the source predicate;

deriving a new range predicate based on the target column; and

introducing the new range predicate into the query, wherein the query is executed to retrieve data from one or more data stores.

12. (Original) The article of manufacture of claim 11, wherein the operations further comprise:

merging the new range predicate into the query.

13. (Previously Presented) The article of manufacture of claim 11, wherein the operations further comprise:

generating a bounds view from source predicate information and range binding information collected for the target column, wherein the bounds view computes a lower bound and an upper bound for the new range predicate, and wherein the bounds view ~~may be~~ is capable of being generated using at least one of a range multiplying technique or a range stretching technique.

14. (Original) The article of manufacture of claim 11, wherein the operations for matching the query to an outlier materialized query table further comprise:

creating a first query graph model representation of the query;

creating a second query graph model representation of the outlier materialized query table; and

comparing the first query graph model and the second query graph model.

15. (Original) The article of manufacture of claim 11, wherein there is a join in the outlier materialized query table and wherein the operations for matching further comprise determining that join predicates other than the outlier predicate in the outlier materialized query table have matching predicates in the query.

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

16. (Original) The article of manufacture of claim 15, wherein the new range predicate is derived by selecting the target column from base tables involved in the join.

17. (Original) The article of manufacture of claim 16, wherein the target column is from a table other than a table in which the source column resides.

18. (Original) The article of manufacture of claim 16, wherein the target column is from a same table as the one in which the source column resides.

19. (Original) The article of manufacture of claim 11, wherein the query contains a correlation predicate.

20. (Original) The article of manufacture of claim 19, wherein the operations further comprise:

translating the correlation predicate into a join predicate in a context of the outlier materialized query table;

when the translated join predicate matches the join predicate in the outlier materialized query table, deriving a new predicate for the correlation predicate in a child query block using a source predicate on a quantifier of a parent query block; and

wherein searching the query for the source predicate further includes searching the parent query block for the source predicate.

21. (Previously Presented) A system for executing a query, comprising:  
means for matching a query to an outlier materialized query table that stores exception data;

means for searching the query for a source predicate;

means for searching an outlier predicate in the outlier materialized query table that corresponds to the source predicate for a target column that corresponds to a source column in the source predicate;

means for deriving a new range predicate based on the target column; and

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

means for introducing the new range predicate into the query, wherein the query is  
executed to retrieve data from one or more data stores.

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

#### REMARKS/ARGUMENTS

Claims 1-21 are pending in the application. Reconsideration is respectfully requested. Applicant submits that the pending claims 1-21 are patentable over the art of record and allowance is respectfully requested of claims 1-21.

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al. (U.S. Patent No. 6,850,933) in view of Admitted Prior Art. Applicants respectfully traverse.

The Examiner submits that Larson does not explicitly indicate the claimed "materialized query table that stores exception data", but cites Admitted Prior Art as teaching this and submits that it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because materialized query table that stores exception data of APA's teaching would have allowed Larson's system to optimize the queries in the database system. Applicants respectfully traverse.

As described in the Specification, on page 15, paragraph 34:

If there are outliers, then predicate (1) is not semantically equivalent and the calculation of the range for the new predicates considers the outliers that are stored in the outlier MQT. Additional adjustments may be made to form the new predicate.

Thus, when there are outliers, the calculation of the range for the new range predicate must consider outliers that are stored in the outlier MQT. Merely replacing the views of the Larson patent with outlier materialized query tables will not result in the claimed invention.

In particular, claims 1, 11, and 21 describe deriving a new range predicate based on the target column and introducing the new range predicate into the query, wherein the query is executed to retrieve data from one or more data stores.

In the Background of the Invention section of the Specification, pages 2-3, paragraph 8 describes that:

Using this materialized query table, newly introduced predicates ("new predicates" or "new range predicates") are generated to help with the access plan of the underlying

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

table, while the exception or outlier data is picked up from the materialized query table and added to the result (using a UNION ALL approach).

With this conventional approach, the exception or outlier data is picked up from the materialized query table and added to the result (using a UNION ALL approach), which teaches away from the claimed derivation of a new range predicate based on the target column (which is in an outlier predicate in the outlier materialized query table) and introduction of the new range predicate into the query.

Also, the Larson patent at Col. 16, lines 29-35 describes that flexibility is provided by the column equivalences, range predicates, and hubs. The Larson patent's mere mention of range predicates does not teach or suggest deriving a new range predicate based on the target column (which is in an outlier predicate in the outlier materialized query table).

Claims 1, 11, and 21 describe introducing the new range predicate into the query, wherein the query is executed to retrieve data from one or more data stores. The Larson patent at Col. 7, line 66 to Col. 8, lines 1-8, describes that the compensating range predicates are determined that are to be applied to the view to produce the query result; and, if a query range matches the corresponding view range, no further restriction is needed; if the lower bound does not match, the view result is restricted by enforcing the predicate ( $T.C \geq lb$ ); and, if the upper bounds differ, the predicate ( $T.C \leq ub$ ) is enforced. There is no description in the cited portion of the Larson patent of deriving a new range predicate based on the target column (which is in an outlier predicate in the outlier materialized query table) and introducing the new range predicate into the query, wherein the query is executed to retrieve data from one or more data stores. Also, applying the range predicates to the view teaches away from introducing the new range predicate into the query.

Therefore, Applicants respectfully submit that claims 1, 11, and 21 are not taught or suggested by the Larson patent or Admitted Prior Art, either alone or together.

Dependent claims 2-10 and 22-20 incorporate the language of independent claims 1 and 11 and add additional novel elements. Therefore, dependent claims 2-10 and 22-20 are not taught or suggested by the Larson patent or Admitted Prior Art, either alone or together, for at least the same reasons as were discussed with respect to claims 1 and 11.

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

Furthermore, claims 10 and 20 describe translating the correlation predicate into a join predicate in a context of the outlier materialized query table; when the translated join predicate matches the join predicate in the outlier materialized query table, deriving a new predicate for the correlation predicate in a child query block using a source predicate on a quantifier of a parent query block; and wherein searching the query for the source predicate further includes searching the parent query block for the source predicate.

The Larson patent at Col. 16, lines 55-67 describes that, whenever the optimizer finds a SPJ+G expression, the view matching rule is invoked and all substitutes produced by view matching participate in cost-based optimization in the normal way. The cited portion of the Larson patent does not teach or suggest translating the correlation predicate into a join predicate in a context of the outlier materialized query table.

The Larson patent at Col. 8, lines 40-67, describes an example view and an example query, while FIG. 3 illustrates a flow diagram of a method of determining whether a view contains the rows needed by the query (Col. 2, lines 21-23). The cited portion of the Larson patent does not teach or suggest, when the translated join predicate matches the join predicate in the outlier materialized query table, deriving a new predicate for the correlation predicate in a child query block using a source predicate on a quantifier of a parent query block.

The Larson patent at Col. 8, lines 40-67, FIG. 7, describes an example view and an example query, while FIG. 7 illustrates a flow diagram of a method of determining supersets of a key (Col. 2, lines 34-36). The cited portion of the Larson patent does not teach or suggest that searching the query for the source predicate further includes searching the parent query block for the source predicate.

Amdt. dated February 14, 2007  
Reply to Office action of December 14, 2006

Serial No. 10/721,802  
Docket No. SVL920030080US1  
Firm No. 0055.0069

### Conclusion

For all the above reasons, Applicant submits that the pending claims 1-21 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0460.

The attorney of record invites the Examiner to contact her at (310) 553-7973 if the Examiner believes such contact would advance the prosecution of the case.

Dated: February 14, 2007

By:     /Janaki K. Davda/    

Janaki K. Davda  
Registration No. 40,684

Please direct all correspondences to:

Janaki K. Davda  
Konrad Raynes & Victor, LLP  
315 South Beverly Drive, Ste. 210  
Beverly Hills, CA 90212  
Tel: (310) 553-7973  
Fax: 310-556-7984